RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 52-05-07

Log Event A

Borehole Information

Farm : TY	**Tank :** TY-105	**Site Number :** 299-W15-186
N-Coord : 42,357	**W-Coord :** 75,872	**TOC Elevation :** 671.05
Water Level, ft :	**Date Drilled :** 8/31/1974	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:
According to the driller's records, this borehole was not perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of published thickness for schedule-40, 6-in. steel tubing.

Equipment Information

Logging System : 1	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 04/1996	**Calibration Reference :** GJPO-HAN-5	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number : 1	**Log Run Date :** 4/30/1996	**Logging Engineer:** Mike Widdop
Start Depth, ft.: 97.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 0.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 5/1/1996	**Logging Engineer:** Mike Widdop
Start Depth, ft.: 65.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 50.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Analysis Information

Analyst : S.D. Barry

Data Processing Reference : P-GJPO-1787 Analysis Date : 1/31/1997

Analysis Notes :

This borehole was logged in two log runs with one relog section. The pre-survey field verification spectra from the second log run did not pass the acceptance criteria established for the peak shape and system efficiency. A nonconformance report issued in August 1996 (N-96-05) identified this failure as a power supply malfunction that resulted in a low detector bias voltage supplied to the logging tool. This malfunction occurred in the mornings immediately following system start-up, but ceased after an extra long warm-up period (about 1 to 2 hours). The nonconformance report also documents that concentrations calculated from data collected in the first 2 hours of logging could be systematically understated by about 10 percent. Therefore, data from the relog section may show a repeatability problem upon relogging of the borehole in the future.

The post-survey field verification spectra for both log runs and the pre-survey field verification spectra from the first log run passed the acceptance criteria for the peak shape and system efficiency, providing evidence that the logging system was operating appropriately after an initial warm-up time. The energy calibration and peak-shape calibration from verification spectra that successfully met the established acceptance criteria were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation. Corrections for gain drifts during data collection were not necessary during processing of the data to maintain proper peak identification.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclides Cs-137 and Co-60 were detected in this borehole. The presence of Cs-137 was measured continuously from the ground surface to about 11 ft, intermittently from 11 to 51 ft, continuously from 51 to 76.5 ft, and from 87 to 88 ft. The maximum Cs-137 concentration was 32.4 pCi/g at 52.5 ft. Measurable Co-60 concentrations were detected almost continuously from 1 to 2.5 ft, 5.5 to 7 ft, and 51.5 to 97 ft. The maximum Co-60 concentration was 7.1 pCi/g at 62 ft.

The K-40 concentrations begin to increase at about 45 ft and the Th-232 and U-238 concentrations begin to increase at about 92 ft.

The interval between 50 and 65 ft was relogged to check the quality of the radionuclide concentration measurements made by the SGLS. The concentrations of the anthropogenic and natural radionuclides were calculated using separate data sets at the overlapping depths. The radionuclide concentrations calculated from the rerun data generally repeated within two standard deviations (two-sigma or 95-percent confidence intervals) of the concentration values calculated from the first log run, indicating excellent repeatability of the measurements. The relog plot shows that the potential repeatability problem may be less than predicted.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank TY-105.

Log Plot Notes:

Separate log plots show the man-made (Cs-137 and Co-60) and the naturally occurring radionuclides (KUT).

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The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

The relog interval between 50 and 65 ft is shown on a separate plot.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A time-sequence plot was generated from the historical gross gamma logs from 1975 to 1993 and the plot is included with the SGLS logs.